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|-------------------------------|------------------------|---------------------|--|
| Notice of Allowability | Application No. | Applicant(s) | |
| | 09/963,788 | FREUND ET AL. | |
| | Examiner | Art Unit | |
| | Yelena G. Gakh, Ph.D. | 1743 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to Interview on 02/27/04.
2. The allowed claim(s) is/are 1 and 3-22.
3. The drawings filed on _____ are accepted by the Examiner.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some*
 - c) None
 of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 030104.
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application (PTO-152)
6. Interview Summary (PTO-413),
Paper No./Mail Date _____
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Joseph R. Baker, Jr. on 02/27/04.
3. The application has been amended as follows:

cancel claims 23-47 without prejudice; cancel claim 3.

In claim 1, in second, third and fifth lines of the body of the claim: after "conductive" insert -- metal --;

in forth-fifth lines, after "one or more chemical groups" insert -- comprising one or more ligands --.

In claim 2 after "conductive" insert -- metal -- and after "particles" insert -- comprising one or more metals --.

In claim 4 delete [chemical groups include one or more]; after "ligands" insert -- are --.

In claim 10 after "conductive" insert -- metal --.

In claim 12, in forth line of the body of the claim after "conductive" insert -- metal --.

In claim 17 after "conductive" insert -- metal --.

In claim 22 in second and third lines of the body of the claim after "conductive" insert -- metal --; in third line replace [metallic] to -- metal -- and after "core" insert -- bounded to a chemical group --; in seventh line: replace [metallic core] with -- metal particles --; delete [a] before "capped" and change [particle] to -- metal cores by displacing the chemical groups with the chemical analyte; --; in ninth line change [metallic core] to -- metal particles--.
4. The following is an examiner's statement of reasons for allowance: the closest prior art of Snow (US 6,221,673 B1, IDS), Mulvaney et al. (WO 99/21934) and Perez et al. (WO 00/14520), disclosing sensors based on nanoparticles comprising conductive metal core with attached ligands, the ligands being heterofunctional groups such as amine, hydroxyl, halogen, phosphoryl,

etc., does not teach or fairly suggest the method of detecting analytes, in which analytes **displace** ligands (i.e. react with the metal core), rather than react with them.

Other related prior art includes *Scott et al. (Anal. Chem., 1997)* disclosing studies on exchange of air-oxidized alkanethiol self-assembled monolayers on gold; *Lewis et al. (US 5,571,401)* disclosing a “sensor arrays for detecting analyzers in fluids”, i.e. electronic nose, comprising conductive (conducting polymers, metals or metal alloys) and non-conductive materials, wherein the interaction of the analytes with the sensors leads to changing in electrical conductivity; *Wohltjen et al. (Anal. Chem., 1998)* discloses “colloidal metal-insulator-metal ensemble [MIME] chemiresistor sensor” with various ligands bound to the metal cores, indicating that “adding specific chemical functionalities to the ligand shell is an obvious and facile way to adjust the selectivity and sensitivity for a wide variety of chemical analytes in both condensed and vapor phase”, which means that analytes are reacting with functionalities of the ligands; *Nemori et al. (EP 1,120,648 A1, JP 2000266753A)*, teaching a method for detecting thiol-containing compounds by changing a color of a colloidal dispersion or thin membrane comprising metal particles (gold, silver, etc.), which are blended with hydrophilic binder (macromolecules).

Vossmeye et al. (US 2003/0109056 A1), disclosing “chemical sensors from nanoparticle/dendrimer composite materials”, in particular amine-stabilized Au-particles, which can easily undergo ligand-exchange reactions with thiols because of the weaker binding with metal cores, is not a prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Drawings

5. Drawings are objected to because they are informal. The formal drawings are required for the allowed case.

Art Unit: 1743

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yelena G. Gakh
3/2/04

A handwritten signature in black ink, appearing to read "Yelena Gakh".